BOB SMITH INDUSTRIES
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USING CYANOACRYLATE AND EPOXY ADHESIVES

Cyanoacrylates (CAs) have become the adhesive of choice for most hobby and household applications. High quality CAs such as INSTA-CURE™, when used properly, form bonds that in many cases are stronger than the material that is being adhered. INSTA-CURE™ is a highly refined CA which, combined with its freshness, gives a guaranteed 2 year shelf life.

CAs are reactive monomers that chemically link (polymerize) when pressed into a thin film. The very thin layer of water moisture present on most surfaces acts as an alkali, or weak base, which is the catalyst that results in bonding; however, the presence of detectable amounts of water usually degrades the performance of CAs.

INSTA-CURE™ has a water-thin viscosity that wicks deep into joints by capillary action and cures in a matter of a few seconds. Surfaces to be bonded must be tight fitting and should be held together while you apply the CA around the edges of the seam. At the moment CAs cure, they give off a vapor that can irritate the nose and eyes, so be prepared. Thin CAs work very well on balsa since they penetrate into the wood and form more than just a surface bond.

INSTA-CURE+™ is a higher viscosity CA for loose fitting joints in which the adhesive must bridge gaps. Normally, the thicker CA is applied to one surface and then the parts are held tightly together for about 5 to 15 seconds. For large surface areas, including those with close fitting joints such as laminations, INSTA-CURE+™ should also be used. To prevent premature curing, don't spread the glue into a thin film. Lay down a serpentine bead with about 1" separations on one surface, then assemble the parts, letting the pressure spread the CA out.

INSTA-SET™ is a catalyst which acts as an accelerator that allows CAs to quickly cure in thick layers by enhancing the alkaline conditions during polymerization. INSTA-SET™ in a spray bottle is normally used to cure the CA that flows from joints when parts are pressed together. Applying an additional bead of thick CA along a seam and then curing it with INSTA-SET™ significantly enhances a joint's strength. For difficult to bond materials, INSTA-SET™ can be applied to one surface and CA to the opposite surface. When brought together, they will bond instantly. INSTA-SET™ is formulated with a strawberry scent and activates CA in 6 to 8 seconds with little degrading of the CAs strength, which is a problem with many other accelerators. INSTA-SET™ is 100% foam safe and can be used on clear plastic.

CYANOACRYLATES

MAXI-CURE™ extra thick 10-25 second CA is the best CA for most plastics, including GE's Lexan™. MAXI-CURE™ is the best choice for plastic model assembly. When used with INSTA-SET™ it will fill most voids. It can be carved with a knife or razor blade and sanded to form a finish indistinguishable from plastic. Its extra thickness makes MAXI-CURE™ easier to work with for most applications.

MAXI-CURE™ bonds hardwood and plywood better than any other hobby adhesive. For gluing to the inside, cloth textured surface of fiberglass, scrape the area to be bonded with a razor blade or coarse sandpaper before using MAX-CURE™ or any other adhesive. Plywood should be lightly sanded before bonding.

SUPER-GOLD™ and **SUPER-GOLD+**™ are our odorless INSTA-CURE™ CAs. They are non-frosting and take only 2 or 3 seconds longer to bond. There are no fumes that irritate the nose and eyes. The SUPER-GOLD™'s are 100% foam safe; therefore, they can be used in the building of foam core wings and the assembly and repair of plastic and foam ARF's. They will not fog clear plastic. SUPER-GOLD+™ is ideal for attaching clear canopies in plastic model kits; however, MAXI-CURE™ is still recommended for assembling the rest of plastic kits. Wood can be bonded to white foam with SUPER-GOLD+™ in less than fifteen seconds. For bonding foam to foam, spray a very light fog of INSTA-SET™ to one piece and apply SUPER-GOLD+™ to the other before joining. Excess INSTA-SET™ may create too much heat, which can melt the foam. Both SUPER-GOLD™'s cure to a more flexible consistency for better shock absorption. Whenever a large amount of CA is to be used in such applications as saturating fiberglass or Kevlar, SUPER-GOLD™ eliminates the irritating fumes from the evaporating monomer that make repeated use of CA unpleasant at times.

IC-2000™ is a rubber-toughened cyanoacrylate that forms superior shock resistant bonds on non-porous surfaces. The black colored CA has added flexibility for the bonding of metals, fiberglass, rubber, carbon-fiber and other advanced materials. For model use, IC-2000™ is ideal for the bonding of bulkheads, formers and servo rails to the inside of fiberglass hulls and fuselages. Set-up time is 20-40 seconds, which can be accelerated with INSTA-SET™. When cured, IC-2000™ is pliable enough to be carved with a hobby knife. IC-2000™ is the best adhesive for R/C car tires.

UN-CURE™ debonder will soften cured CA. If parts are bonded incorrectly or your fingers are stuck together, a few drops of UN-CURE™ will dissolve the CA in about a minute. Apply on bonded skin and roll apart fingers. Once unstuck, use acetone to clean off softened CA, then wash off with soap and water. UN-CURE™ will easily remove the adhesive residue from price tags or tape, but care must be taken since it will also remove the paint from many surfaces; however, this also means it is an extremely good solvent to clean paint brushes.

IC-GEL™ is a cyanoacrylate paste that is extremely thick which comes in an applicator tube like toothpaste. It has the same bonding and curing time characteristics as MAXI-CURE™; IC-Gel™, however, can be applied to a vertical surface and will stay in place. It will not run. This can be very convenient for some assembly applications. Applying CA to the bottom of a horizontal surface, such as a ceiling, can be very difficult with anything other than a full standard CA bottle. IC-GEL™ can be applied at any angle with just a squeeze of the tube. The gel does, however, have a tendency to continue to come out of the tube for about a second after pressure is released, so this must be taken into account to apply the exact amount of IC-GEL™ that you want.

IC-GEL™ is an excellent putty for plastic models. It will fill any void and can be formed to many shapes. Applying INSTA-SET™ allows IC-GEL™ to be sanded or filed to final shape in less than 20 seconds. Autobody repairmen have finished their jobs in a fraction of the time by using IC-GEL™ with the additional advantage over normal body putties of superior bonding to metal surfaces.

IC-GEL™'s most popular application is for the bonding of fragments of live coral (frags) to underwater rocks in aquariums. It has proven to be non-toxic to aquatic organisms and provides instant bonding for the propagation of the coral. IC-Gel has a superior shelf life of over three years and its application nozzle makes it the easiest of all CAs to apply.

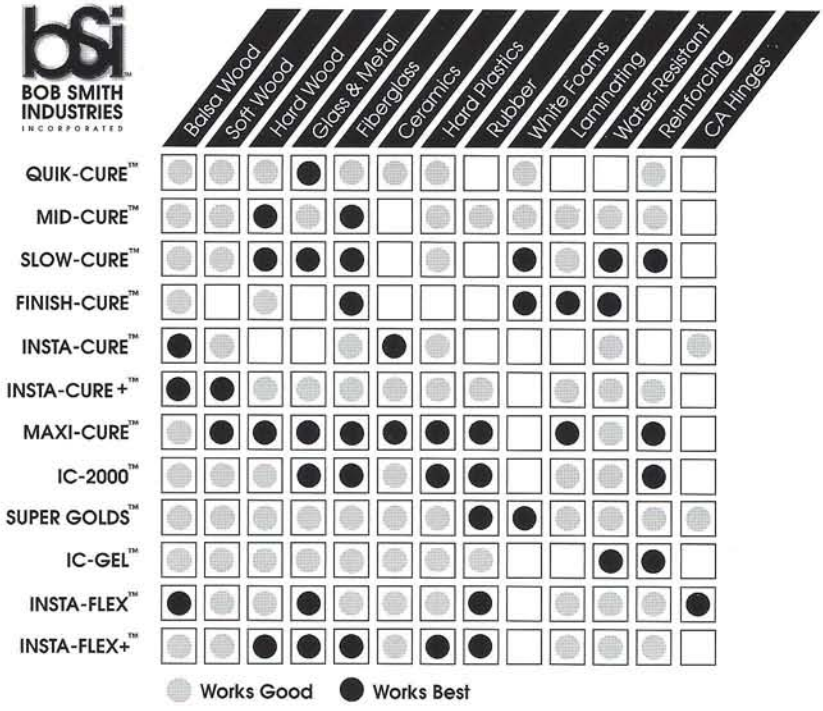
INSTA-FLEX™ flexible thin CA is ideal for many applications, including the installation of CA hinges. When cured, INSTA-FLEX™ does not turn brittle and remains clear, even if accelerated with INSTA-SET™. It has superior shock resistance. Although not as thin in consistency as INSTA-CURE™, INSTA-FLEX™ still has good penetrating qualities and its application can be easier to control. For CA hinges, we recommend drilling a 1/16" hole in the center of the hinge slots to insure the complete saturation of the hinge when INSTA-FLEX™ is applied. INSTA-FLEX™ has a different, less irritating odor compared to regular CAs, but still can not be used on white foam. INSTA-FLEX™ has also proven to be superior when bonding anodized aluminum.

INSTA-FLEX+™ clear rubber toughened has similar qualities to our black IC-2000™ but can be used in applications where you do not want the adhesive to be seen. The carbon component of IC-2000™ that gives the CA its black color also contributes to it's unsurpassed strength. Since INSTA-FLEX+™ has this carbon removed, its strength is a little less than IC-2000™ but still superior to standard CAs. When esthetics are important and a flexible bond is required, INSTA-FLEX+™ is your best choice. It forms superior bonds to soft urethane and vinyl plastics. Both INSTA-FLEX™ and INSTA-FLEX+™ work well when bonding R/C car tires. When a joint has a larger than normal gap, flexible CAs provide superior shock resistant bonds.

Heat and moisture will decrease the shelf life of CAs. Unopened bottles can be stored in a freezer or refrigerator, but allow them to reach room temperature before using. Keep your bottles in a cool place that won't be exposed to direct sunlight and store away from bottles of accelerators. Due to the freshness of our CAs, their shelf life is guaranteed for 24 months.

For the initial opening of the top, loosen and retighten the top first to relieve internal pressure, then hold the bottle against a near vertical surface and cut off the top 1/32" with a knife or razor blade without squeezing the bottle. To prevent clogging, do not let the tip of the nozzle touch a surface that has been sprayed with INSTA-SET™. Before replacing the colored cap, set the bottle down hard to knock the remaining CA back into the bottle before squeezing it in an upright position to blow air through the nozzle, then wipe the tip clean.

With all CAs, the closer the parts fit together, the stronger the bond. Always hold the bonding surfaces together as tightly as possible. Any rough spots on the mating surfaces should be smoothed out. Although CAs will hold objects together with considerable strength within seconds, the full strength of the bond is not reached for several hours. Allow for this before subjecting parts to maximum stress. Also, CAs are generally a little less brittle and have higher strength when they are allowed to cure on their own.



EPOXIES

If CAs are the cure-all for just about all bonding problems, you may be wondering, "Why do I need epoxy?" One primary reason is price. Epoxy costs are about one fourth that of CA. When large objects are being bonded, economics can be a deciding factor on choice of adhesive. The specific characteristics of epoxies also give them advantages in some applications.

All our epoxies are mixed with a 50-50 ratio. Any scrap material or paper scratch pad can be used as a mixing surface. We have found, however, that the plastic tops to coffee cans work best due to their outer border and their flexibility, which allows the unused cured epoxy to be released and thrown away. Squeeze out equal length beads of the desired amount of epoxy, then mix together thoroughly with a popsicle stick or scrap piece of material.

In cold weather, epoxy takes longer to cure (too cold and usually they never fully cure) and becomes more difficult to get out of the bottle, especially if it's less than 1/2 full. The epoxies can be heated in a microwave oven for about 10 seconds so that they flow easier. The heating process, with the caps off, also releases any moisture that can be absorbed by epoxies. Their shelf life, therefore, is virtually unlimited.

Acetone works as the best solvent for cleaning epoxy from brushes and unwanted surfaces before it cures. If epoxy gets on surfaces that acetone will attack, use isopropyl alcohol. Isopropyl alcohol that is 90-99% pure can be used to thin epoxy, but by no more than 15-20%. Most rubbing alcohols are only 70% pure. Heat will also cause epoxy to be less viscous. FINISH-CURE™ is thin enough to be brushed.

Epoxies bond best to clean, textured surfaces. Smooth, non- porous surfaces should be roughened with coarse sandpaper to improve adhesion. A small amount of CA can be used in strategic locations to hold parts in place while the epoxies cure. The minute designations for epoxies refer to the working time, i.e., the time one has before the epoxies begin to set up after being mixed in a large mass. When spread into thinner layers, the working time is increased significantly (except QUIK-CURE™). Working time decreases approximately 25% at temperatures above 90 degrees F.

Don't panic if your skin comes in contact with either epoxy or CA. While contact should be avoided, uncured epoxy can be washed from your skin with soap and water. Allergic reactions are rare, but we recommend the wearing of disposable gloves for easier cleanup. Cured epoxy and CA can be peeled off the skin and usually are gone after a full day from the normal shedding of the outer layer of our skin. UN-CURE™ will debond any body parts that get stuck together if a peeling action (never pulling) doesn't part them.

QUIK-CURE™ 5 min. epoxy cures to a slightly flexible consistency. This lack of brittleness allows it to form a lasting bond in areas subjected to high vibration or stress. QUIK-CURE™ shouldn't be used in areas that are subject to long-term immersion in water; however, it works fine for the internal structure of wood framed boats. QUIK-CURE™ is our only epoxy on which you can apply polyester resins. It can be mixed with microballoons to form a quick setting putty. Items bonded with QUIK-CURE™ can be handled after 15 minutes. Full strength is reached in 1 hour.

MID-CURE™ 15 min. epoxy is used in larger areas where more working time is needed. It is more water resistant and can be used as a substitute for QUIK-CURE™ in most applications. MID-CURE™ is ideal for gluing to fiberglass surfaces. Allow 45 minutes before handling parts and 2 hours for full strength. Use when temperatures are above 70° F.

SLOW-CURE™ 30 min. epoxy works best for forming reinforcing fillets on joints. It has the highest strength of our epoxies. It is waterproof and more heat resistant. SLOW-CURE™ can be used for bonding if you're willing to wait overnight. Fillers such as microballoons can be mixed with SLOW-CURE™ and FINISH-CURE™ to form a putty-like consistency. Such fillers will usually decrease the working time by about 25%. Bonded objects can be handled after 8 hours and the cured epoxy reaches full strength within 24 hours.

SLOW-CURE™ is the best choice for bonding wing halves together and for attaching firewalls and tail surfaces to the fuselages of model aircraft. To get the full 30 minutes of working time, SLOW-CURE™ should be mixed on a flat surface. If mixed in a cup in warmer weather, the working time of SLOW-CURE™ may be reduced to less than 15 minutes.

FINISH-CURE™ 20 min. epoxy is an excellent, low odor substitute for polyester resins. It can be used for applying fiberglass cloth to wood or by itself to give wood a surface ready for primer and paint. FINISH-CURE™ can be sanded the easiest of all our epoxies and is excellent for the sheeting of foam core wings. Allow 8 hours for full curing. For best results, FINISH-CURE™ should be heated to a temperature above 85°. For applying light weight fiberglass, lay cloth on balsa first, then brush on FINISH-CURE™. When fully saturated, go over the surface with a heat gun, and then squeegee off excess epoxy with a playing card from an old deck. Heat and remove excess several times for a light weight finish. If room temperature is below 70° use a heat gun on the surface several times for the next 2 hours. When dry, use 180 grit sandpaper on a hard backed sanding block to achieve a smooth finish ready for primer. A second coat of FINISH-CURE™ isn't usually necessary. For heavy weight fiberglass, apply the epoxy before and after laying down the cloth. FINISH-CURE™ is best mixed in a disposable cup in quantities of 1 oz. or less.

NEW PRODUCTS

FOAM-CURE™ is a silicone based adhesive that works very well on EPP and EPO foams. It is crystal clear and cures to a more flexible consistency than CA. It is, however, not instant bonding like CA and there is no accelerator to speed it's curing. To obtain a faster initial bond when bonding two pieces, FOAM-CURE™ can be applied to one piece and after the two are joined, they can then be pulled apart. After letting it air dry for about ten minutes, FOAM-CURE™ will act like a contact cement when the parts are rejoined, resulting in enough tack strength to allow the next steps of assembly. Full strength is reached in 10-12 hours.

FOAM-CURE™ works with all foams, and will actually bond most other materials. It will bond wood and plastic to foam, and is a good canopy glue. FOAM-CURE™ does not, however, cure flexible enough to act as a hinge for aircraft control surfaces. Its limitations occur when bonding large areas of two non-porous materials. FOAM-CURE™ requires exposure to air for drying. If one tried to bond, for example, a half-dollar coin to glass, over 90% of the adhesive would never cure, since the solvent it contains would have no where to evaporate.

PLASTIC-CURE™ is a gap-filling formulation of CA that works best on plastics. It is packaged in a bottle with a brush built into its top, which in many cases is an easier way to apply the CA. As long as brush is put back into the bottle after use, the bristles of the brush will not harden. Care must be taken, however, not to introduce foreign material into the bottle. The brush should not be used, for example, to apply CA to wood that has been freshly sanded. PLASTIC-CURE™ will also bond wood, but its brush applicator at times will not be the best way to apply it.

PLASTIC-CURE™ is superior for the application of false nails and wraps on fingernails, where its brush is the preferred method of application.

IC-LOC™ threadlockers are made for use on screws, nuts and bolts to prevent loosening due to vibration. IC-LOC™ Blue and IC-LOC™ Red are applied to threads before assembly. IC-LOC™ Blue's medium strength allows parts to be taken apart (with some effort). IC-LOC™ Red is high strength and forms a permanent bond that does not allow fasteners to be removed. IC-LOC™ Green is a penetrating formulation that will reach into treads and therefore can be applied to fasteners that are already in place. It takes more effort to remove fasteners locked in place with Green when compared to Blue.

ULTRA-CURE™ is a very high performance clear cyanoacrylate that has a viscosity (thickness) in-between that of Insta-Cure Super Thin and Insta-Cure+ Gap Filling Medium. It is ideal for the mounting of rubber tires onto R/C car wheels. It is available in our 3/4 oz Pocket CA bottle and comes with one of our new #304 Extender Tips for the Pocket CA pin-in-cap top. ULTRA-CURE™ can be used in many other applications that require a slightly thicker thin CA and will bond virtually everything. It is not foam-safe, however.

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